SAFETY LIGHTING FOR VEHICLE OUTSIDE MIRRORS

BACKGROUND OF THE INVENTION

1. Field of the invention.

The present invention relates to light emitting diode (L.E.D.) lamp assemblies mounted as a unit on the vehicle outside mirror housings to provide safety indication of vehicle operation.

11. Description of the Prior Art.

Large trucks have for years been fitted by their owner operators with strip lighting for running lights and with small lights on the rear of their driving mirrors for braking and directional signals.
Lights have been fitted recently on the mirrors of some pick-ups and S.U.V.'s such as G.M.C. 2002 Envoy and on the Ford Windstar minivan and on autos such as the Mercedes Benz C class. Some supplied on mirrors made by Donnelly Corp. of Holland , Mi. and Ichikob Manufacturing Inc., of Novi, Mi.

SUMMARY OF THE PRESENT INVENTION

The present invention provides a unique means for enhancing the safety of vehicle operation using lamp assemblies located on the underside rearwards and on the rear of the mirror housings and out of the line of vision of the vehicle operator. Both lights visible to approaching vehicles and the underside lights visible to following vehicles.
The lamp assemblies consist of light emitting diodes (L.E.D.s) units of four mounted on a single unit neoprene base. The L.E.D.s use tiny amounts of energy and operate for days with the vehicle stopped and the hazard lamps flashing, without discharging the battery.

BRIEF DESCRIPTION OF THE DRAWINGS

A better understanding of the present invention will be had upon reference to the following detailed description when read in conjunction with the accompanying drawings, where like reference characters refer to like parts through several views , and in which :

FIG 1. Is a front view of the embodiment. Partly in section.
FIG 2. Is a sectional view of this embodiment , of the line 11
FIG. 3. Is a view of a L.E.D. lamp assembly , Detail 3, full size.
FIG 4. Is a front view of the switch assembly.
FIG 5. Is a top view of the switch assembly, full size, line V.
FIG 6. Is a sectional view of the switch assembly, full size, line V1
FIG 7. Is a view of the switch mounting angles
FIG 8. Is a solid state schematic diagram of this embodiment.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

As best shown in figures 1, 2 and 3, the lamp assembly is formed in a single base 10 of 6o-70 durometer neoprene that can be applied to fit various shaped housings. Also molded as part of the base is a tubular bumper to offer protection to the lenses 11 and 12 and to carry alarm switch 18 and the wiring for the lamps 3. The lamps press into formed holders and connect to sockets 16, and the lenses, white 11 and amber 12 press into the formed base. A single lamp fits under the white lens and four lamps fit under the amber. A flexible hose 14 carries the wiring and through connector 13 joins the safety bumper to the vehicle fender through connector 15. The wiring may also be made internally through the passenger door. An adhesive backed metallic silvered tape 17 attaches to the underside of the mirror housing and forms snugly around the rear to reflect the light. The base 10 fits over the tape and mounts by adhesive and screws to the mirror housing. Switch 18 is operated if the bumper is depressed and switches on the hazard condition.

As best shown in figures 4, 5, and 6, the switch housing 21 mounts on the steering wheel column adjacent to the directional lever, the switch operator 20 mounts on the steering wheel casting, the switch operator and the switch housing are positioned so that operator 20 trips central switch 23 when the steering wheel is in the straight ahead position. As best shown in figure 7 the straight ahead position switch is at S and a 5 degree steering wheel turn right will trip switch R and a 5 degree steering wheel turn left will trip switch L, the operater 20 being 10 degrees wide will trip either switch L or switch R before releasing switch S. A lamp lights either right or left on the near underside of the lamp assembly indicating a possible lane change.Returning to the straight ahead position switches off the lights. Further turning of the steering wheel in either direction will signal a moving change and the second , the third and the fourth lamps light and turn off in timed sequence to indicate turning direction. The lights will reset by returning to the straight ahead position. Switch intermediates 22 change a cam motion into a down thrust. Toggle switch 24 provides the hazard signal and also resets the bumper alarm.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION, THE LOGIC CONTROL SCHEMATIC DIAGRAM:

As best shown in figure 8:
Vehicle inputs (I/P's) connected to the logic circuit:
P. Connected to the 'right turn' wiring.
O. Connected to the 'left turn' wiring.
Q. Connected to the 'brake on ' wiring.
U. Connected to the 'in reverse' wiring.
V. Connected to the 'Ignition on' wiring
W. Connected to the 'Hot all time' through alarm switch.
Switch assembly inputs (I/P's) connected to the logic circuit:
S. Steering wheel in 'Straight ahead' position
R. Steering wheel in 'turning Right' position
L. Steering wheel in 'turning Left' position
T. Hazard switch "on' and alarm cancel 'on-off'.

Vehicle outputs (O/P's) connected to the logic circuit shown:
For the right hand rear view mirror housing
A. Switch on the lamp nearest R.H. door, vehicle moving right
B. Switch on next lamp, vehicle turning right and after delay
C. Switch on next lamp, and after delay
D. Switch on next lamp, and after delay, switch off ' B 'and reset
After delay, repeat 'B', 'C', 'D', sequence.
I. Switch on lamp , running light.
For the left hand rear view mirror housing
E. Switch on the lamp, nearest L.H. door, vehicle moving left
F. Switch on next lamp, vehicle turning left and after delay
G Switch on next lamp, and after delay
H. Switch on next lamp, and after delay, switch off 'F' and reset
After delay, repeat 'F', 'G', 'H', sequence
J. Switch on lamps, running and clearance lamps.

Steering directional signaling, logic circuit operation:

Right hand assembly - left hand similar.
Turning right a few degrees releases switch S and removes I/P from the 'not' unit and gives the I/P to the 'sealed and' unit 1r, further turning trips switch R and gives input to seal in 1r, O/P from unit 1r gives I/P to modifier A and the 'moving right' lamp lights. Returning to the 'straight ahead' position trips switch S and removes I/P to reset unit 1r.
Further turning from the 'moving right' condition releases switch R and gives input to unit 2r, with 'not' I/P's O and S and timed I/P from unit 1r, unit 2r seals in and provides I/P to unit 3r. Unit 3r gives I/P to dwell timer and I/P to modifier B and the first of the 'turning right' lamps light. After a short dwell, timer gives I/P to modifier C and the second of the 'turning right' lamps light, after a short dwell a timer gives an I/P to modifier D and the third of the 'turning right' lamps light. Another short dwell timer will turn off unit 3r to reset all timers to repeat the B, C, and D cycle to provide a flashing 'turning right' indication.
Operation of the left hand vehicle turn signal removes output at O to reset unit 2r and reset unit 3r and B, C, and D, and turn off the 'turning right' signaling. Returning to the 'straight ahead' position trips switch S and resets all units.
Units 4r and 5r give a 360 degree turn right signal for indication only.

Further logic circuit operations:
A 'brake on' I/P signal at Q removes I/P's to units 3r and 3l and gives inputs to modifiers B,C,D and F,G,H, to light their respective lamps,
A 'vehicle in reverse' I/P at U, a 'hazard' I/P at U, an 'alarm' I/P at W gives I/P's to units 3r and 3l and then through their respective timers to modifiers B,C,D, and F,G,H, to sequence and light the left and right hand lamps.
A 'ignition on' signal at V gives I/P's at modifiers I and J to light the left and right hand running and clearance lamps.